Extract from:

JLH - a lifetime in electronics

…….. …However, these were early days, and I was quite content with my Williamson mono set up - the snag lying in the 'mono' bit.

Turntable trauma
When my old friend, the Seascale carpenter, made the cabinets for our two radiograms, he fitted each with a Decca turntable and its XMS sapphire-stylus pick-up. This seemed quite a good choice in 1952, before the advent of stereophonic LPs, even though the playing weight of the spring counterbalanced head was 40g or thereabouts.

Sadly though, there was no way that the Decca system would play a 'stereo' disc without jumping up and down during the loud bits.

Replacing the turntable and pick-up would have presented little difficulty, though any new system would probably not have fitted as snugly as the original joiners installation.

The real problem was what to do about the single Williamson power amplifier. Quite apart from the cost and difficulty of buying and installing another Williamson, with its separate 450V power supply, there simply wasn't room in the cabinet to accommodate it.

So my thoughts turned to constructing two equivalent transistor power amplifiers. This solution would certainly save space, but it had to sound as good too.

I treated the requirement as if it were for a typical industrial control system. The emphasis would be on simplicity - on the premise that 'what you don't put in won't go wrong'. I designed and made up the experimental four transistor power amplifier circuit shown in Fig. 8.

Why was it n-p-n throughout?
At that time, 1965, silicon p-n-p transistors were not very good, so the design used only n-p-n power devices. The opposite was the case with germanium devices, where it was the n-p-n ones which were relatively poor in performance.

This design operated in class A, which removed any problems which might arise with class 'AB' output bias level settings.

On being tested with a 35V supply line, this amplifier worked very well. It had an output power of a little over 10W, a THD figure rather better than 0.1%, and a bandwidth of 10Hz to 100kHz,+/-0.5dB. This was very encouraging - especially when I compared its sound quality against the Williamson, and concluded that it was at least as good.

On seeing these results, I built a tidied-up stereo version as a Christmas present to myself in 1967. Some time later, I replaced the output transistors with Motorola 'epitaxial base' 2N3055s.

With an increase in the supply voltage to 45V, the new transistors allowed an output power of more than 15W. This was equivalent to the Williamson, though I am unconvinced that I ever needed or used more than two watts.

Unlike the Lin design, my 10W Class-A circuit did not use a push-pull pair of output devices to provide the required low output impedance. Instead it used a 'Darlington pair' connected amplifier stage, comprising Q1 and Q3, driving Q2 as an active load. Transistor Q4 gave increased loop gain for the AC and DC feedback loops.

My first audio article
It had not occurred to me to seek to publish my design. But two of my friends urged me to do so.

John Greenbank, an assistant editor on Wireless World at the time, greeted my contribution with enthusiasm. Unknown to me. the topic of Class-A versus Class-AB was one of current hi-fl debate. As a result of this publication, I suddenly found myself to be a hi-fi guru …….

Fig. 8 The 10W class A design.